

1

OPERATING SYSTEM INSTALLATION**BACKGROUND AND INTRODUCTION**

The invention relates to methods and apparatus for the installation of operating systems in computers.

The invention finds particular application in the installation of operating systems in computers which are linked by means of a network, for example a local area network.

Typically, for installing an operating system at a local computer, it is necessary to supply a data storage medium, for example a CD-ROM or floppy disk carrying the operating system, this being inserted into an appropriate reader at the local computer and to perform the installation in accordance with the operating system supplier's instructions. Typically, the operating system provides a standard configuration of the operating system at the local computer. After, or during basic installation it is often possible to customise the installation depending on the requirements of the user. However, in this case the customization is performed by the user and there is no control over the customization.

Where the local computer forms part of a computer network, for example within an organisation, it is desirable that limits are put on the customization which is effected on installation of the operating system. Indeed, it is desirable that the customization is standardised. This facilitates the achievement of compatibility throughout a network. However, there are added benefits in that a user not at his or her normal workstation can still readily use another workstation because the basic configuration will be familiar, even if there are differences at a local level due to local or regional requirements. As well as some local or regional requirements, for example depending on the country in which the installation is performed, the customization which is needed will also depend on hardware characteristics of the local computer and also the function of the local computer, for example as a client workstation, or as a server in a local area network.

It has been proposed to control the customization of the local computer by providing additional media (for example floppy disks) which are used in combination with the media carrying the operating system, in order to control the installation of the operating system at the local computers. However, the maintenance of the installation software is a very expensive task due to the rapid changes in hardware and software configurations. Even relatively minor changes to the installation software can result in significant consequential changes being needed.

It will be appreciated that the installation of operating systems at local computers which form part of a network presents significant technical problems. These result from the need to permit standardisation, while still permitting the installation of the operating system to be customised depending upon the hardware configuration of the computer concerned and also its function (for example a workstation providing a user desktop, or a server for a network). Accordingly, the present invention seeks to mitigate the technical problems associated with the installation of an operating system in local computer which is connected or connectable to a remote management computer.

SUMMARY OF THE INVENTION

In accordance with a first aspect of the invention, therefore, there is provided an automated method of installing an operating system at a local computer connected or connectable to a remote management computer, said method comprising:

2

- (a) providing a standard operating system on a storage medium at said local computer;
- (b) supplying, from a memory at said management computer and via a connection to said local computer, a modular definition of an operating system model, said model defining a customised configuration of said standard operating system;
- (c) performing a standard installation of said operating system to a memory of said local computer; and
- (d) employing said model to perform customization of said operating system.

The use of a modular definition of a model of a customised operating system installation facilitates the maintenance of the customised installation to take account of changes in hardware and software, as well as local or regional requirements. By selection of predetermined self-contained modules to form the model, a high degree of flexibility can be achieved while still permitting the customization to be constrained to fall within guidelines of a network operator in order to achieve compatibility and uniformity.

Preferably, at least one model defines an operating system configuration for a client workstation. This is probably the most common installation to be performed. However, other models can be directed to the installation of a local server, a portable workstation, etc.

Preferably, a hierarchical database is provided in the memory at the central computer for controlling the customization, wherein each model is defined in terms of a set of modules, each module of the set being self-contained and defining an installation customization operation.

The hierarchical structure facilitates execution of the installation process and permits the assembly of a sequence of modules for implementing the model.

In a preferred example, the modules define respective post-processing operations following the standard installation. For example, for at least one model, the modules define respective post-processing operations selected from the following list:

- installation of files for remote systems access;
- setting of boot target addresses;
- installation of patches;
- restoration of archived data and/or software;
- installation of unbundled software; and
- securing of the operating system.

Alternatively, or in addition, the modules can define respective pre-processing operations performed prior to the standard installation. In this case, for at least one model, the modules define respective post-processing operations selected from the following list:

- setting hardware characteristics; and
- automatically archiving data and/or software for subsequent restoration.

The installation is preferably responsive to hardware configuration data for the local computer in a rules file to identify an appropriate model file in the hierarchy for customization of the operating system.

In the preferred embodiment, the model file defines the modules by means of links within the hierarchy.

In accordance with another aspect of the invention, there is provided a management system for controlling the installation of an operating system on a local computer, said management system being stored at a management computer remote from said local computer, said local computer being connected or connectable to said management computer, wherein said management system comprises at least one modular definition of a model of a customised configuration